MITSUBISHI

CC-Link System Master/Local Module

User's Manual

(Hardware)

QJ61BT11N

Thank you for purchasing the Mitsubishi programmable controller MELSEC-Q Series.

Prior to use, please read both this manual and detailed manual thoroughly to fully understand the product.

MELSEC-Q
Mitsubishi Programmable Controller

MODEL	QJ61BT11N-U-HW
MODEL CODE	13JP16
IB(NA)-0800250-E(0809)MEE	

● SAFETY PRECAUTIONS ●

(Always read these precautions before using this equipment.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The instructions given in this manual are concerned with this product. For the safety instructions of the programmable controller system, please read the user's manual of the CPU module to use.
In this manual, the safety instructions are ranked as "DANGER" and "CAUTION".

⚠DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Note that the ⚠ **CAUTION** level may lead to a serious consequence according to the circumstances.
Always follow the instructions of both levels because they are important to personal safety.
Please save this manual to make it accessible when required and always forward it to the end user.

[Design Precautions]

⚠CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100mm (3.9inch) or more from each other.
  Not doing so could result in noise that may cause malfunction.

[Installation Precautions]

⚠CAUTION
● Use the programmable controller in an environment that meets the general specifications contained in the CPU user's manual to use. Using this programmable controller in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product. ● While pressing the installation lever located at the bottom of module, insert the module fixing tab into the fixing hole in the base unit until it stops. Then, securely mount the module with the fixing hole as a supporting point. Incorrect loading of the module can cause a malfunction, failure or drop. When using the programmable controller in the environment of much vibration, tighten the module with a screw. ● Tighten the screw in the specified torque range. Undertightening can cause a drop, short circuit or malfunction. Overtightening can cause a drop, short circuit or malfunction due to damage to the screw or module. ● Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module. Not doing so may cause damage to the module. ● Do not directly touch the module's conductive parts or electronic components. Touching the conductive parts could cause an operation failure or give damage to the module.

[Wiring Precautions]

⚠CAUTION
● When turning on the power and operating the module after wiring is completed, always attach the terminal cover that comes with the product. There is a risk of malfunction if the terminal cover is not attached. ● Use applicable solderless terminals and tighten them with the specified torque. If any solderless spade terminal is used, it may be disconnected when the terminal screw comes loose, resulting in failure. ● Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation. Tightening the terminal screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction. ● Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation. ● The module has an ingress prevention label on its top to prevent foreign matter, such as wire offcuts, from entering the module during wiring. Do not peel this label during wiring. Before starting system operation, be sure to peel this label because of heat dissipation. ● Use a dedicated cable as specified by the manufacturer for the CC-Link system. If a cable other than the one specified by the manufacturer is used, the performance of the CC-Link system cannot be guaranteed. Also, follow the specifications listed in the CC-Link System Master/Local Module User's Manual for the overall cable distance and the station-to-station cable length. If wiring is done other than as specified, accurate transmission of data cannot be guaranteed. ● Be sure to fix communication cables or power supply cables leading from the module by placing them in the duct or clamping them. Cables not placed in the duct or without clamping may hang or shift, allowing them to be accidentally pulled, which may cause a module malfunction and cable damage. ● Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. Not doing so could result in noise that may cause malfunction. ● When removing the communication cable or power supply cable from the module, do not pull the cable. When removing the cable with a connector, hold the connector on the side that is connected to the module. When removing the cable connected to the terminal block, first loosen the screws on the part that is connected to the terminal block. Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable.

Revisions

* The manual number is noted at the lower right of the top cover.

Print Date	*Manual Number	Revision
Mar., 2003	IB(NA)-0800250-A	First edition
Sep., 2005	IB(NA)-0800250-B	Correction SAFETY PRECAUTIONS, Chapter 4
Apr., 2006	IB(NA)-0800250-C	Correction Section 1.2, 2.1, 5.1
Aug., 2007	IB(NA)-0800250-D	Correction Chapter 4, 6
Sep., 2008	IB(NA)-0800250-E	Correction SAFETY PRECAUTIONS, Compliance with the EMC and Low Voltage Directives, Section 2.1, 2.2, 3.1, Chapter 4, Section 5.1, Chapter 6

Contents

About Manuals

The following manual is also related to this product.
In necessary, order it by quoting the details in the table below.

Detailed Manual

Manual name	Manual number (Model code)
CC-Link System Master/Local Module User's Manual QJ61BT11N	SH-080394E (13JR64)

Compliance with the EMC and Low Voltage Directives

(1) For programmable controller system
To configure a system meeting the requirements of the EMC and Low Voltage Directives when incorporating the Mitsubishi programmable controller (EMC and Low Voltage Directives compliant) into other machinery or equipment, refer to Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).
The CE mark, indicating compliance with the EMC and Low Voltage Directives, is printed on the rating plate of the programmable controller.

(2) For the product
For the compliance of this product with the EMC and Low Voltage Directives, refer to the "CC-Link module" section in the Chapter 9 "EMC AND LOW VOLTAGE DIRECTIVES" of the QCPU User's Manual (Hardware Design, Maintenance and Inspection).

1. Overview

This manual explains the specifications, names of each part and the settings, etc., for the QJ61BT11N CC-Link System Master/Local Module (hereinafter QJ61BT11N) used in combination with the MELSEC-Q Series programmable controller CPU. After unpacking, confirm that the following products are enclosed.

Item name	Quantity
QJ61BT11N main unit	1
Terminal resister 110 Ω 1/2W (brown, brown, brown)	2
Terminal resister 130 Ω 1/2W (brown, orange, brown)	2

1.1 Compatibility with CC-Link

This product supports the following CC-Link functions and performance.

- Cyclic transmission
- Increase of cyclic transmission data size
- Transient transmission
- Less restrictions on the station-to-station cable length

1.2 CC-Link Version

There are two types of CC-Link version, i.e., Ver.1 and Ver.2.

(1) Definition of Ver.1.00 and Ver.1.10

Version 1.10 modules have a uniform station-to-station cable length of 20 cm or more by improving the restrictions on the conventional station-to-station cable length.

In contrast, the conventional modules are defined as Ver.1.00.

In order to make the station-to-station cable length uniformly 20cm or more, the following conditions are required:

(a) All the modules that configure the CC-Link system must be compatible with Ver.1.10.

(b) All data link cables must be CC-Link dedicated cables conforming to Version 1.10.

Point
The specifications for Version 1.00 should be used for the maximum cable overall distance and station-to-station cable length if a system contains modules of both Version 1.00 and Version 1.10.

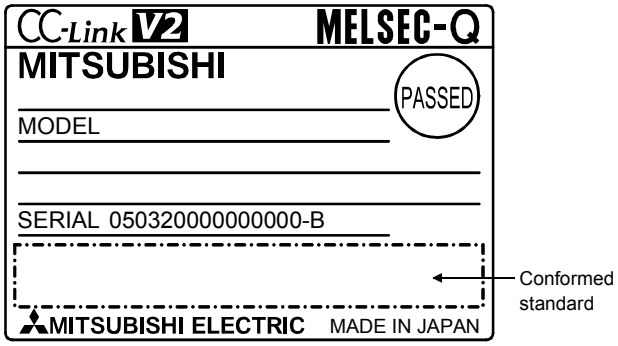
(2) Definition of Ver.2

As Ver.2 is characterized as increase of cyclic transmission data size, Ver.2-compatible module is defined to support this function.

(3) Checking version

The modules including CC-Link logo on the rated plate are compatible with Ver.1.10.

The modules including V2 logo on the rated plate are compatible with Ver.2.



2. Performance Specifications

2.1 Performance Specifications

The performance specifications of the QJ61BT11N are shown below.
Refer to the User's Manual of the CPU for the general specifications of the QJ61BT11N.

Table 2.1 Performance Specifications

Item	Specifications
Transmission speed	Can select from 156kbps/625kbps/2.5Mbps/5Mbps/10Mbps
Maximum overall cable distance (Maximum transmission distance)	Varies according to the transmission speed (Refer to section 2.2)
Maximum No. of connected modules (master station)	64
No. of occupied stations (local stations)	1 to 4 stations The number of stations can be switched using the GX Developer parameter setting.
Maximum No. of link points per system *1	Remote I/O (RX, RY) : 2048 points Remote register (RWw) : 256 points (master station → remote device station/local station/intelligent device station/standby master station) Remote register (RWr) : 256 points (remote device station/local station/intelligent device station/standby master station → master station)
No. of link points per remote station/local station/intelligent device station/standby master station *1	Remote I/O (RX, RY) : 32 points (local station is 30 points) Remote register (RWw) : 4 points (master station → remote device station/local station/intelligent device station/standby master station) Remote register (RWr) : 4 points (remote device station/local station/intelligent device station/ standby master station → master station)
Communication method	Broadcast polling method
Synchronization method	Frame synchronous method
Coding method	NRZI method
Transmission path	Bus (RS-485)
Transmission format	Conforms to HDLC
Error control system	CRC($X^{16}+X^{12}+X^5+1$)
Connection cable	CC-Link dedicated cable/CC-Link dedicated high-performance cable/Version 1.10 compatible CC-Link dedicated cable
RAS functions	• Automatic return function • Slave station cut-off function • Error detection by the link special relay/register
No. of I/O occupied points	32 points (I/O assignment: Intelligent 32 points)
5V DC internal current consumption	0.46A
Weight	0.12kg

*1: Indicates the number of link points for remote net Ver.1 mode. For number of link points for remote net Ver.2 mode/remote net additional mode, refer to the table 2.2.

*2: Ver.1.10-compatible CC-Link dedicated cables, CC-Link dedicated cables (Ver.1.00) and CC-Link dedicated high-performance cables cannot be used together. If used together, correct data transmission will not be guaranteed. Also attach the terminal resister which matches the kind of the cable. (Refer to section 5.1)

Table 2.2 Number of link points for remote net Ver.2 mode/remote net additional mode

Item			Specifications			
Maximum No. of link points per system			Remote I/O (RX, RY) : 8192 points Remote register (RWw) : 2048 points (master station → remote device station/local station/ intelligent device station/standby master station) Remote register (RWr) : 2048 points (remote device station/local station/intelligent device station/standby master station → master station)			
No. of link points per station	Expanded cyclic setting		Single	Double	Quadruple	Octuple
	Remote I/O (RX, RY)		32 points (30 points for local station)	32 points (30 points for local station)	64 points (62 points for local station)	128 points (126 points for local station)
	Remote register (RWw)		4 points	8 points	16 points	32 points
	Remote register (RWr)		4 points	8 points	16 points	32 points
No. of link points per number of occupied stations	Occupies 1 station	Remote I/O (RX, RY)	32 points	32 points	64 points	128 points
		Remote register (RWw)	4 points	8 points	16 points	32 points
		Remote register (RWr)	4 points	8 points	16 points	32 points
	Occupies 2 station	Remote I/O (RX, RY)	64 points	96 points	192 points	384 points
		Remote register (RWw)	8 points	16 points	32 points	64 points
		Remote register (RWr)	8 points	16 points	32 points	64 points
	Occupies 3 station	Remote I/O (RX, RY)	96 points	160 points	320 points	640 points
		Remote register (RWw)	12 points	24 points	48 points	96 points
		Remote register (RWr)	12 points	24 points	48 points	96 points
	Occupies 4 station	Remote I/O (RX, RY)	128 points	224 points	448 points	896 points
		Remote register (RWw)	16 points	32 points	64 points	128 points
		Remote register (RWr)	16 points	32 points	64 points	128 points

2.2 Maximum Overall Cable Distance

The maximum overall cable distance differs according to the transmission speed. For the relationship between transmission speed and maximum overall cable distance, see the CC-Link System Master/Local Module User's Manual.

2.3 CC-Link Dedicated Cable

Use the CC-Link dedicated cables for the CC-Link system.
If a cable other than the CC-Link dedicated cable is used, the performance of the CC-Link system cannot be guaranteed.
For the specifications of the CC-Link dedicated cables or any other inquiries, visit the following site:
CC-Link Partner Association website: http://www.cc-link.org/.

Remark

For details, refer to the CC-Link cable wiring manual issued by CC-Link Partner Association.

3. Installation

3.1 Handling Precautions

The handling precautions for the module are given below.

(1) Do not drop the module case or subject it to heavy impact since it is made of resin.
(2) Do not remove the PCB of each module from its case. This may cause a failure in the module.
(3) Be careful not to let foreign objects such as wire burrs enter the module during wiring. In the event any foreign object enters, remove it immediately.
(4) The top surface of the module is covered with a protective film to prevent foreign objects such as wire burrs from entering the module during wiring. Do not remove this film until the wiring is complete. Before operating the system, be sure to remove the film to provide adequate heat ventilation.
(5) Solderless terminals with insulation sleeve cannot be used for the terminal block.
It is recommended that the wiring connecting sections of the solderless terminals will be covered with a marking tube or an insulation tube.
(6) Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the module.
Failure to do so may cause a failure or malfunctions of the module.
(7) Tighten the screws such as module fixing screws within the following ranges.

Screw location	Tightening torque range
Module fixing screws (M3 screw)*1	0.36 to 0.48N • m
Terminal block screws (M3 screw)	0.42 to 0.58N • m
Terminal block mounting screws (M3.5 screw)	0.66 to 0.89N • m

*1: The module can be easily fixed onto the base unit using the hook at the top of the module. However, it is recommended to secure the module with the module fixing screw if the module is subject to significant vibration.

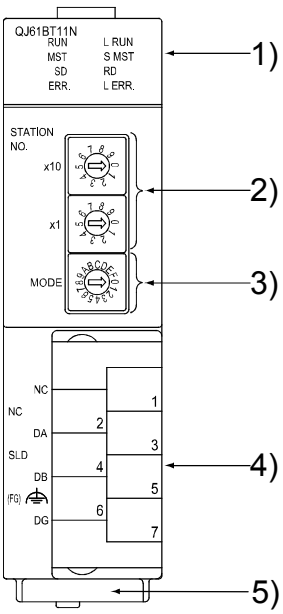
(8) To mount the module on the base unit, fully insert the module fixing latch into the fixing hole in the base unit and press the module using the hole as a fulcrum. Improper installation may result in a module malfunction, or may cause the module to fall off.

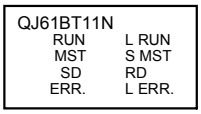
POINT
(1) Be sure to turn off the power supply to the applicable station before installing or removing the terminal block. If the terminal block is installed or removed without turning off the power supply to the applicable station, correct data transmission cannot be guaranteed. (2) Always make sure to power off the system in advance when removing the terminal resistor to change the system. If the terminal resistor is removed and mounted while the system is energized, normal data transmission will not be guaranteed.

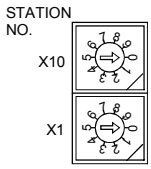
3.2 Installation Environment

Refer to the User's Manual of the CPU module in use.

4. Part Names and Settings



No.	Name	Details	
1)	LED indicators 	Verify the data link state with the LED ON/OFF.	
		LED name	Details
		RUN	ON: Operating normally OFF: Watch dog timer error
		ERR.	ON: All stations have a communication error Also lights up when the following errors occur. • Switch type setting is incorrect • There are more than one master station on the same line • There is an error in the parameter contents • The data link monitoring timer was activated • The cable is disconnected Or, the transmission path is affected by noise. Flashing: A communication error station identified, or remote station No. duplicated.
		MST	ON: Operating as a master station (in data link control)
		S MST	ON: Operating as a standby master station (in standby status)
		L RUN	ON: Data link is being executed
		L ERR.	ON: Communication error (host) Flashing at fixed intervals : The settings of switches 2) and 3) were changed while the power is on. Flashing irregularly : The terminal resistor is not attached. The module and CC-Link dedicated cable are affected by noise.
		SD	ON: Data being sent
		RD	ON: Data being received

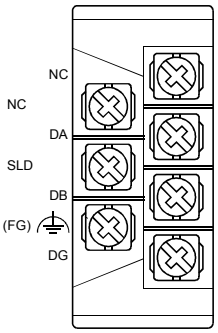
No.	Name	Details
2)	Station No. setting switch 	Set the module station No. (setting at the time of shipment: 0) <Setting range> Master station : 0 Local station : 1 to 64 Standby master station : 1 to 64 If a number other than 0 to 64 is set, the "ERR." LED lights up.

"MST" and "S MST" LED indicator lamp status and station types

Type of station set	Operation status	
	Operating as a master station (controlling data link)	Operating as a standby master station (standing by)
Master station	MST ✱ ○ S MST	MST ○ ✱ S MST
Standby master station	MST ✱ ○ S MST	MST ○ ✱ S MST
Local station	———	———

✱ : On, ○: Off

No.	Name	Details		
3)	Transmission speed/ mode setting switch 	Set the transmission speed and operating conditions for the module (settings at time of shipment: 0)		
		Setting value	Transmission speed settings	Mode
		0	Transmission speed 156kbps	Online
		1	Transmission speed 625kbps	
		2	Transmission speed 2.5Mbps	
		3	Transmission speed 5Mbps	
		4	Transmission speed 10Mbps	
		5	Transmission speed 156kbps	Line test When station NO. setting switch is set to 0: Line test 1 When station NO. setting switch is set to 1 to 64: Line test 2
		6	Transmission speed 625kbps	
		7	Transmission speed 2.5Mbps	
		8	Transmission speed 5Mbps	
		9	Transmission speed 10Mbps	
		A	Transmission speed 156kbps	Hardware test
		B	Transmission speed 625kbps	
		C	Transmission speed 2.5Mbps	
		D	Transmission speed 5Mbps	
		E	Transmission speed 10Mbps	
		F	Setting not allowed.	

No.	Name	Details
4)	Terminal block 	Connect the CC-Link dedicated cable for the data linking. Refer to section 5.1 for details on the connection methods. The terminals SLD and FG are connected inside the module. Since a 2-piece type terminal block is used, the module can be replaced without disconnecting the signal line to the terminal block. (Replace the module after turning its power OFF.)
5)	Serial number plate	Indicates the serial No. of the QJ61BT11N.

POINT
The settings of the station No. setting switch and the transmission speed/mode setting switch become valid when the module power is turned from OFF to ON or the programmable controller CPU is reset. Thus, if the settings were changed while the module power was ON, turn the module power from OFF to ON or reset the programmable controller CPU again.

5. External Wiring

5.1 Connecting the Modules Using the CC-Link Dedicated Cables

This section explains how to connect the master module, local modules, standby master module, remote modules and intelligent device modules with the CC-Link dedicated cables.

(1) CC-Link cables can be connected from any station No..

(2) Connect the supplied "terminal resistors" to each module at both ends of the CC-Link system.
Connect the terminal resistors between “DA” and “DB”.
There are restrictions on the case where the A(1S)J61BT11/A(1S)J61QBT11 is used as the master station in a T-branch system configuration. Refer to the CC-Link System Master/Local Module User's Manual for details.

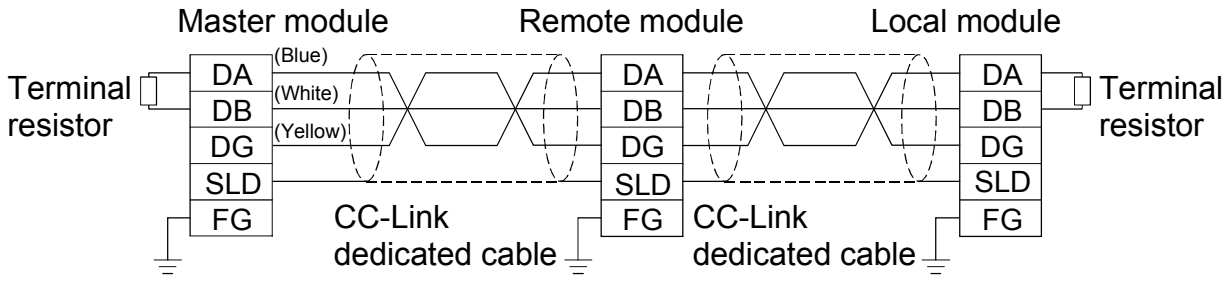
(3) The terminal resistors to be connected vary depending on the types of cables used in the CC-Link system.

Cable type	Terminal resister
CC-Link dedicated cable	110Ω 1/2 W (brown-brown-brown)
Version 1.10 compatible CC-Link dedicated cable	
CC-Link dedicated high-performance cable	130Ω 1/2 W (brown-orange-brown)

(4) The master module can be connected at points other than both ends.

(5) Star connection is not allowed.

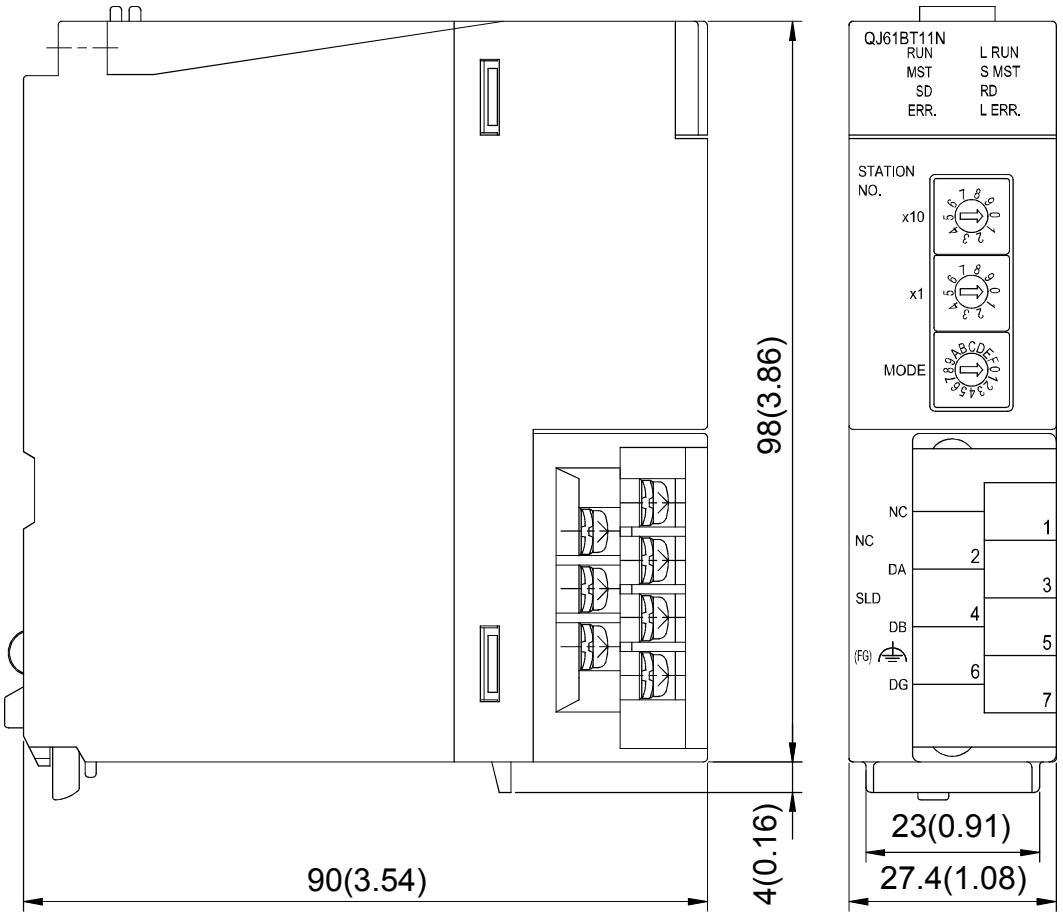
(6) The connection method is shown below.



IMPORTANT
Ver.1.10-compatible CC-Link dedicated cables, CC-Link dedicated cables (Ver.1.00) and CC-Link dedicated high-performance cables cannot be used together. If used together, correct data transmission will not be guaranteed.

POINT
Connect the shielded wire of the CC-Link dedicated cable to “SLD” of each module, and ground the both ends of the shielded wire using D type grounding via "FG". The SLD and FG are connected within the module.

6. External Dimensions



Unit: mm(inch)

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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